

Claims

1. A gas flow arrangement apparatus comprising a gas entrance and a gas exit, a first flow path from the gas entrance to the gas exit through a means for at least partly removing at least one pollutant from a gas flow stream and second flow path from the gas entrance to the gas exit other than through the removing means.
2. A gas flow arrangement apparatus according to claim 1, in which the gas flow path passing through the pollutant removing means intersects the first gas flow.
3. A gas flow arrangement apparatus according to claim 1 or claim 2, in which the first flow path diverges from the second flow path upstream of the pollutant removing means.
4. A gas flow arrangement apparatus according to any preceding claim, in which the first flow path and the second flow path intersect with each other downstream of the pollutant removing means.
5. A gas flow arrangement apparatus according to any preceding claim, in which the first gas flow splits from the second gas flow path at a separator for diverting pollutant to the pollutant removing means.
6. A gas flow arrangement apparatus according to claim 5, in which the separator is generally conically shaped

with an opening for one of the gas flow paths therethrough.

- 5 7. A gas flow arrangement apparatus according to any preceding claim, in which the first flow path diverges from the second flow path at a tube through which gas can pass.
- 10 8. A gas flow arrangement apparatus according to claim 7, in which the tube is a perforated tube.
- 15 9. A gas flow arrangement apparatus according to any preceding claim, in which the arrangement comprises a gas flow tube for the second flow path, which gas flow tube comprises a slot for the first gas flow path to join the second gas flow path.
- 20 10. A gas flow arrangement apparatus according to any preceding claim, in which the arrangement comprises a first chamber, a second chamber and a third chamber, whereby gas enters into a first chamber, passes into a second chamber at which the first flow path diverges from the second flow path, and whereby gas can flow into the third chamber through two openings one of
25 which comprises the pollutant removing means, and in which there is an exit for gas from the third chamber.
- 30 11. A gas flow arrangement apparatus according to any preceding claim, in which the pollutant removing means comprises a filter.

12. A gas flow arrangement apparatus according to claim 11, in which the filter comprises a regenerative filter.

5 13. A gas flow arrangement apparatus according to claim 12, in which the filter is electrically regenerative.

10 14. A pollutant removal device for at least partly removing a pollutant from a gas flow, the device comprising a gas flow arrangement apparatus according to any one of claims 1 to 13.

15 15. A pollutant removal device according to claim 14, in which the device comprises means for at least partially ionising gas flow.

20 16. A pollutant removal device according to claim 15, in which the ionising means comprises an electrode for electrostatic precipitation.

17. A pollutant removal device according to claim 16, in which the electrode is mounted in the second chamber.

25 18. A pollutant removal device according to claim 17, in which the electrode is mounted in the first chamber.

30 19. A pollutant removal device according to any one of claims 14 to 18, in which the apparatus comprises a tube through which the gas stream at least partly flows, whereby the tube is at least partly porous to the gas stream.

20. A pollutant removal device according to claim 19, when dependent on any of claims 15 to 18 in which the tube is at least partly about the ionising means.
- 5 21. A pollutant removal device according to claim 19 or claim 20, in which the tube is perforated.
22. A pollutant removal device according to claim 21, in which the tube comprises a plurality of holes
10 therethrough.
23. A pollutant removal device according to claim 22, in which the holes are evenly spaced.
- 15 24. A pollutant removal device according to claim 22 or claim 23, in which the holes are evenly sized.
25. A pollutant removal device according to any one of claims 21 to 24, in which the perforated region of the
20 tube is substantially annular.
26. A pollutant removal device according to any one of claims 21 to 26, in which the perforated region of the tube extends for a substantial length thereof.
- 25 27. A pollutant removal device according to claim 19 or claim 20, in which the tube comprises at least one slot therethrough.
- 30 28. A pollutant removal device according to claim 27, in which a plurality of slots is provided.

29. A pollutant removal device according to claim 28, in which the slots are substantially evenly distributed about the tube.
- 5 30. A pollutant removal device according to any one of claims 27 to 29, in which the at least one slot runs longitudinally along the tube.
- 10 31. A pollutant removal device according to any one of claims 19 to 30, in which the tube is circular in cross-section.
- 15 32. A pollutant removal device according to any one of claims 19 to 31, in which the tube comprises an inlet and an outlet.
- 20 33. A pollutant removal device according to claim 32, in which the cross-sectional area of the tube decreases along its length from the input to the output thereof.
- 25 34. A pollutant removal device according to any one of claims 20 to 33, in which the tube is at least partly coated with a barrier coating for slowing the discharge time of charged agglomerates.
- 30 35. A pollutant removal device according to any one of claims 16 to 34, in which the electrode is mounted at one end thereof only.
36. A pollutant removal device according to any one of claims 20 to 34, in which the tube is located in the first and second gas flow paths.

37. A pollutant removal device according to any one of claims 14 to 36, in which the apparatus comprises a first expansion tube in fluid communication with an apparatus gas inlet.
- 5 38. A pollutant removal device according to claim 37, in which a diverting tube extends from the first expansion tube to a second expansion tube defined by the tube.
- 10 39. A pollutant removal device according to claim 38, in which there is a third expansion tube about the diverting tube into which gas can flow through the diverting tube.
- 15 40. A pollutant removal device according to claim 38, in which a filter is located between (in respect of gas flow) the second and third expansion tubes.
- 20 41. A pollutant removal device according to any one of claims 14 to 40, in which the device is arranged whereby at least one pollutant is biased towards the first flow path.
- 25 42. A pollutant removal device according to any one of claims 14 to 41, in which a catalytic converter is provided in the second flow path.
- 30 43. A pollutant removal device according to any one of claims 14 to 42, in which the device is for fitting to a vehicle exhaust.

44. A pollutant removal device according to claim 43, in which the device is for fitting in place of the silencer of a vehicle exhaust.

5 45. An apparatus for removing pollutants from a gas stream, the apparatus comprising means for charging particulates in the gas stream and a tube through which the gas stream at least partly flows, whereby the tube is at least partly porous to the gas stream
10 and the apparatus additionally comprises means for collecting at least one pollutant.

46. An apparatus as claimed in claim 45, wherein the tube is at least partly about the charging means.
15 Suitably, the charging means comprises an electrode.

47. An apparatus for removing pollutants from a gas stream, the apparatus comprising means for charging particulates in the gas stream and a tube through which the gas stream at least partly flows, whereby the tube is at least partly porous to the gas stream
20 and the apparatus additionally comprises means for collecting at least one pollutant.

25 48. An apparatus according to claim 47, in which, the tube is at least partly about the charging means.

49. An apparatus according to claim 48, in which the charging means comprises an electrode.

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50. An apparatus according to any one of claims 47-49, in which the tube is perforated.

51. An apparatus according to claim 50, in which the tube comprises a plurality of holes therethrough.
52. An apparatus according to claim 51, in which the holes
5 are evenly spaced.
53. An apparatus according to claim 51 or claim 52, in which the holes are evenly sized.
- 10 54. An apparatus according to any one of claims 47-53, in which the perforated region of the tube is substantially annular.
55. An apparatus according to any one of claims 47-54, in
15 which the perforated region of the tube extends for a substantial length thereof.
56. An apparatus according to any one of claims 47-55, in which the tube comprises at least one slot
20 therethrough.
57. An apparatus according to claim 56, in which a plurality of slots is provided.
- 25 58. An apparatus according to claim 56 or claim 57, in which the slots are substantially evenly distributed about the tube.
59. An apparatus according to claims 56-58, in which the
30 at least one slot runs longitudinally along the tube.
60. An apparatus according to any one of claims 47-59, in which a major portion of the tube is porous.

61. An apparatus according to any one of claims 47-59, in which a minor portion of the tube is porous.

5 62. An apparatus according to any one of claims 47-61, in which the tube is circular in cross-section.

63. An apparatus according to any one of claims 47-62, in which the tube comprises an inlet and an outlet.

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64. An apparatus according to claim 63, in which, the cross-sectional area of the tube decreases along its length from the input to the output thereof.

15 65. An apparatus according to any one of claims 47-64, in which the electrode is mounted at one end thereof only.

20 66. An apparatus according to any one of claims 47-65, in which, there is a first gas flow path from an apparatus gas inlet to an apparatus gas outlet and a second gas flow path from the apparatus gas inlet to the apparatus gas outlet.

25 67. An apparatus according to claim 66, in which a filter is located in the second gas flow path.

30 68. An apparatus according to claim 66 or claim 67, in which the tube is located in the first and second gas flow paths.

69. An apparatus according to any one of claims 47-68, in which the apparatus comprises a first expansion tube in fluid communication with an apparatus gas inlet.
- 5 70. An apparatus according to claim 69, in which the diverting tube extends from the first expansion tube to a second expansion tube defined by the tube.
- 10 71. An apparatus according to claim 70, in which, there is a third expansion tube about the diverting tube into which gas can flow through the diverting tube.
- 15 72. An apparatus according to claim 71, in which, a filter is located between (in respect of gas flow) the second and third expansion tubes.
- 20 73. An apparatus according to any one of claims 47-72, in which the filter comprises an electrically regenerative filter.
74. An apparatus according to any one of claims 47-73, in which the apparatus is for removing pollutants from an exhaust gas stream.
- 25 75. A combustion generator comprising an apparatus according to the any one of claims 47-74, in which exhaust gas from the generator flows to an apparatus inlet.
- 30 76. A combustion generator according to claim 75, in which the generator is an internal combustion engine.